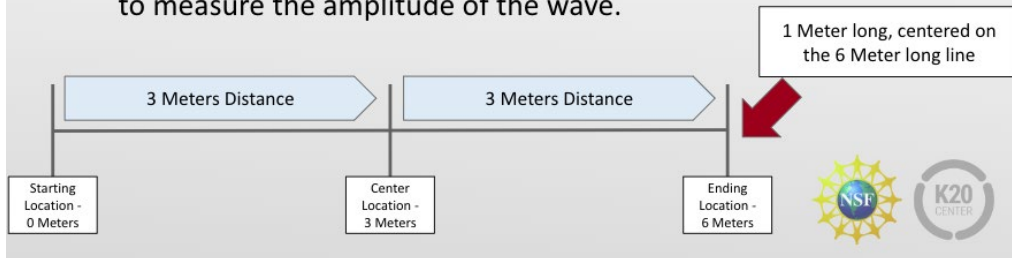


WAVE INTERACTIONS TEACHER GUIDE

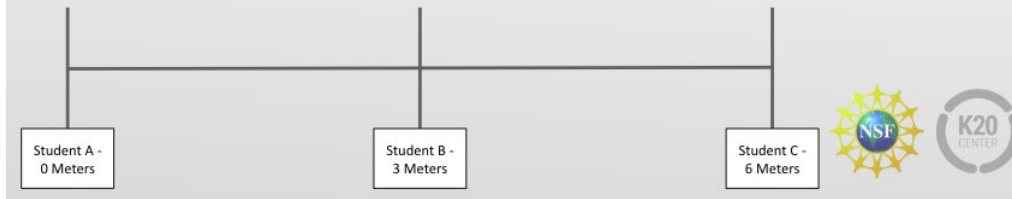
Wave Interactions - Setting Up

- Mark off a 6-meter spot on the floor.
- Use masking tape to mark the following spots:
 - 0 Meters (starting location)
 - 3 Meters (center location)
 - 6 Meters (ending location)
- Each mark should be 1 Meter long
- to measure the amplitude of the wave.

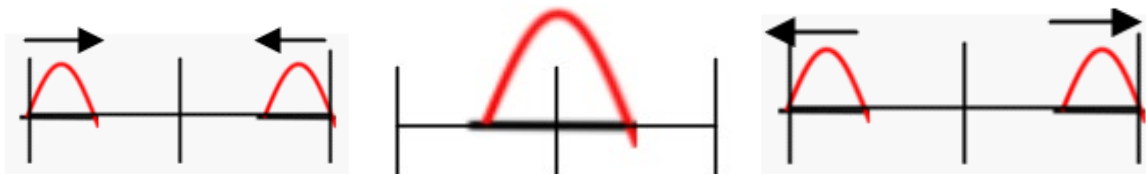


Wave Interactions - Round 1

- How does the displacement at Student B's location compare to the displacement at Student A's location?
- Draw three (3) pictures of the waves:
 - Before they meet in the middle.
 - When they meet in the middle.
 - After they meet in the middle.



The amplitude of the wave should approximately double at the center mark when the two waves combine.



Watch example of constructive interference:

<https://www.youtube.com/watch?v=ypcX1LdmMPM>

Wave Interactions - Round 2

Student Roles

- Student A and Student C- Quickly snap the long spring at the same time but in ***OPPOSITE*** directions.
- Student B - Makes and records observations of the displacement.



Wave Interactions - Round 2

- How does the displacement at Student B's location compare to the displacement at Student A's location?
- Draw three (3) pictures of the waves:
 - Before they meet in the middle.
 - When they meet in the middle.
 - After they meet in the middle.



The amplitude should cancel out and be close to zero at the center mark.



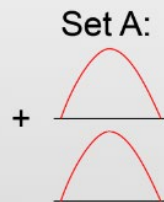
Wave Interactions - Round 2

Does your hypothesis about what happened when the waves combined from *Wave Interactions - Round 1* still make sense?

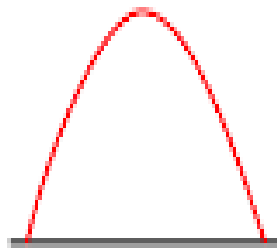


Wave Interactions - Prediction 1

- How would the waves combine?
- Think about math: how do positive and negative numbers combine?



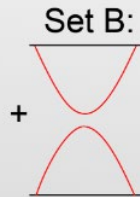
The amplitude of the new wave will be the sum of the amplitude of the individual waves.



Constructive interference describes when waves combine that have amplitude in the same direction so that the result is a wave with a larger amplitude than the original waves.

Wave Interactions - Prediction 2

- How would the waves combine?



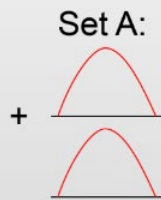
The amplitude of the new wave will be the sum of the amplitude of the individual waves, which cancels the individual waves.



Destructive interference describes when waves combine that have amplitudes opposite directions so that the result is a wave with a smaller amplitude than the original waves.

Wave Interactions - Prediction 1

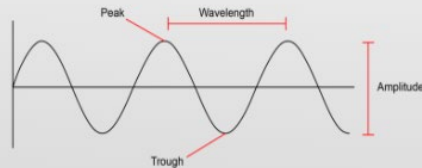
This represents Constructive Wave Interference.
In your own words, define this term.



Wave Interactions

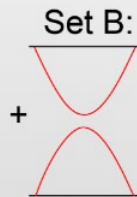
Constructive Interference:

Waves combine peak + peak or trough + trough to produce a wave of larger amplitude.



Wave Interactions - Prediction 2

This represents Destructive Wave Interference.
In your own words, define this term.



Wave Interactions

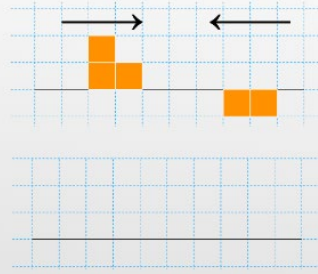
Destructive Interference:

Waves combine peak + trough so that amplitudes cancel one another.

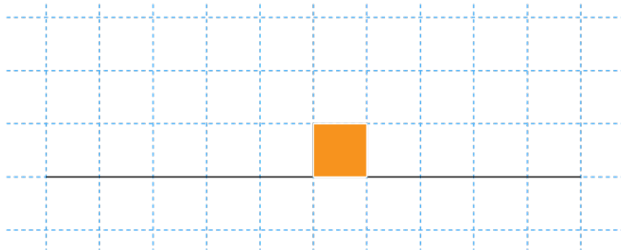


Wave Interactions

- If two pulse waves are sent through a spring in opposite directions, what would the result be the instant they combine?
- Is this constructive or destructive interference?

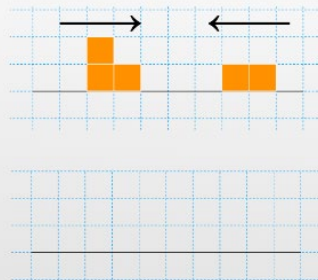


Answer:



Wave Interactions

- If two pulse waves are sent through a spring in opposite directions, what would the result be the instant they combine?
- Is this constructive or destructive interference?



Answer:

